

April 16, 2021

VIA IBFS

Marlene H. Dortch
Secretary
Federal Communications Commission
45 L Street, N.E.
Washington, D.C. 20554

**Re: Written *Ex Parte*, File No. SAT-MOD-20200417-00037
Space Exploration Holdings, LLC, Application for Modification of
Authorization for the SpaceX NGSO Satellite System**

Dear Ms. Dortch:

Pursuant to 47 C.F.R. § 1.1206, Kepler Communications Inc. (“Kepler”) submits additional comments regarding Space Exploration Holdings, LLC’s (“SpaceX”) proposed third modification of its non-geostationary satellite constellation. SpaceX seeks authorization to lower the remaining 2,824 satellites in its constellation to altitudes between 540-570 km, which will result in overlap with Kepler’s previously-authorized and already-operating Ku-band NGSO system operating at altitudes between 500-600 km.¹ Despite filing the Third Modification more than a year ago, SpaceX has yet to resolve a multitude of coordination and orbital debris mitigation concerns raised by Kepler and other satellite operators. The commitments made to date by SpaceX do not resolve the space safety issues related to physical overlap with Kepler’s constellation resulting from SpaceX’s lower altitude and new polar orbits.² Kepler therefore urges the Commission to

¹ See Space Exploration Holdings, LLC, Application for Modification of Authorization for the SpaceX NGSO Satellite System, IBFS File No. SAT-MOD-20200417-00037 (filed Apr. 17, 2020) (“Third Modification”); see also Kepler Communications Inc., Petition for Declaratory Ruling to Grant Access to the U.S. Market for Kepler’s NGSO FSS System, IBFS File No. SAT-PDR-20161115-00114 (Nov. 19, 2018) (“Kepler Grant”).

² See, e.g., letter from David Goldman, Director of Satellite Policy, Space Exploration Technologies Corp., to Marlene H. Dortch, Secretary, Federal Communications Commission, File No. SAT-MOD-20200417-00037, (filed Apr. 15, 2021).

condition any grant of the Third Modification on the requirement that SpaceX ensure its modified operations do not interfere with Kepler's prior-authorized system.

First, the FCC should require SpaceX to mitigate conjunctions in overlapping or intersecting orbits. Specifically, the Commission should require SpaceX to actively perform conjunction avoidance maneuvers in relation to Kepler's satellites. Such a condition would be consistent with recent precedent, including the Kuiper Systems grant, which requires Kuiper to "coordinate physical operations of spacecraft with any operator using similar orbits, for the purpose of eliminating collision risk and minimizing operational impacts."³ The obligation to avoid collisions with Kepler's spacecraft throughout the course of their normal operations—including their passive decay—should be borne by SpaceX, and the Commission should condition grant to require SpaceX to assume conjunction maneuvers vis-à-vis any previously authorized systems.

Second, the FCC should condition grant to require SpaceX to avoid causing harmful interference to previously-authorized systems. The record in this proceeding reflects a clear technical consensus that SpaceX's proposed operations will increase the interference environment for other NGSO systems authorized during the 2016 Processing Round.⁴ If the Commission declines to

³ See *Kuiper Systems, LLC, Application for Authority to Deploy and Operate a Ka-band Non-Geostationary Satellite Orbit System*, Order and Authorization, IBFS File No. SAT-LOA-20190704-00057, FCC 20-102 (Jul. 30, 2020).

⁴ See, e.g., *Kepler Communications, Inc., Petition to Deny Application of Space Exploration Holdings, LLC*, File No. SAT-MOD-20200417-00037, at 1 (filed Jul. 13, 2020) (requesting the application be denied on the basis that "that the Modification as proposed will significantly increase the overall interference environment for some systems, including Kepler's."); Letter from Mariah D. Shuman, Corporate Counsel, Kuiper Systems, to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-MOD-20200417-00037 at 1 (filed Apr. 5, 2021) ("Amazon has presented multiple analyses showing that the Third Modification would create significant interference problems"); Letter from Suzanne Malloy, Vice President, Regulatory Affairs, O3b Limited, to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-MOD-20200417-00037 at 2 (filed Apr. 6, 2021) ("the Modification represents a complete system

require SpaceX share spectrum among NGSO FSS systems authorized or granted in the open 2020 Processing Round, it should ensure that SpaceX protects the operations of its fellow 2016 Processing Round participants from the interference implications of its modification. Whereas SpaceX can employ satellite diversity to maintain service during any in-line interference event with Kepler, Kepler would need to employ unplanned maneuvers to avoid an uncoordinated in-line event with SpaceX, which in itself would result in significant capacity loss and impose an extraordinary burden on Kepler. To prevent shifting the interference mitigation burden caused by the Third Modification to Kepler, the Commission should condition any grant on a requirement that SpaceX optimize its satellite selection to avoid in-line interference events between SpaceX and Kepler spacecraft in the Ku-band.⁵ This is particularly critical in SpaceX's desired polar orbits which almost perfectly overlap with Kepler's, resulting in near constant conjunction and interference concerns.

Third, given SpaceX's ongoing failure to conclude coordination agreements with other 2016 Processing Round Participants, Kepler agrees with OneWeb that the Commission should take this opportunity to clarify the home spectrum priority rule in the NGSO FSS Ku-band.⁶ The record demonstrates that Kepler was the first NGSO FSS Ku-band operator to launch satellites in its

redesign that significantly changes the SpaceX system's 'specific characteristics' and worsens the interference environment for SES's operational O3b NGSO network").

⁵ In the event that grant of the Third Modification is not adequately conditioned to afford protection to Kepler's previously-authorized system for the increase in in-line interference events and inevitable conjunctions, Kepler may be required to increase the size of its own constellation to compensate for lost capacity and the safety of its on-going operations.

⁶ 47 C.F.R. 25.261(c); Letter from Brian D. Weimer, Sheppard, Mullin, Richter & Hampton LLC to Marlene H. Dortch, Secretary, Federal Communications Commission, IBFS File No. SAT-MOD-20200417-00037(Apr. 14, 2021)

system “capable of operating in the frequency band(s) under consideration,” having commenced commercial operations in 2018.⁷ While nothing more is required under the rule, Kepler would still have been first to operate under SpaceX’s fictionalized “U.S. earth station” requirement. Therefore, the Commission should affirm, either as a condition of any Third Modification grant, or as a separate declaratory ruling, that Kepler has home spectrum priority over all other 2016 Processing Round participants in the Ku-band, including SpaceX and OneWeb.

In conclusion, while Kepler has repeatedly expressed its willingness to coordinate with SpaceX to achieve a mutually satisfactory agreement to coexist in overlapping orbits, no such agreement has been concluded.⁸ The increased risk of conjunctions and in-line interference events created by the Third Modification, which remain unaddressed by SpaceX, warrant the imposition of affirmative license conditions to ensure that SpaceX’s modified operations do not reasonably interfere with the expectations and investments of other 2016 Processing Round participants, including Kepler.

Respectfully submitted,

/s/ Nickolas G. Spina

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⁷ 47 C.F.R. 25.261(c); letter from Nickolas G. Spina, Director Launch & Regulatory Affairs, Kepler Communications, Inc. to Marlene H. Dortch, Secretary, Federal Communications Commission, IBFS File No. SAT-LOI-20160428-00041 (May 13, 2019).

⁸ See, e.g., Letter from Nickolas G. Spina, Director of Regulatory Affairs, Kepler Communications to Marlene H. Dortch, Secretary, Federal Communications Commission, File No. SAT-MOD-20200417-00037 (filed Dec. 4, 2020); Petition to Deny of Kepler Communications Inc., File No. SAT-MOD-20200417-00037, at 1 (Jul. 13, 2020).